The History of Kangaroo Populations in Hattah-Kulkyne National Park, North-western Victoria.

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Introduction

Hattah-Kulkyne National Park and the neighbouring Murray-Kulkyne Park, in north-western Victoria (Fig. 1), were declared a Biosphere Reserve in 1982 by the United Nations Scientific and Cultural Organisation (Davis and Drake 1983). The two parks, referred to here as Hattah-Kulkyne, include riverine woodland on the floodplain of the Murray River, mallee shrubland on extensive dunefields, and stands of remnant *Callitris-Casuarina* woodland on open rolling dunes between the mallee and the riverine woodland. Hattah-Kulkyne has had a long history of exploitative land use (Cheal 1986; Walters 1986): the area has been heavily grazed by sheep, cattle and rabbits, while extensive clearing has removed many trees and shrubs, and has promoted grasslands; serious weed infestations and soil instability have developed, and many species of plants and animals have become rare or extinct.

One of the objectives of the current management plan for Hattah-Kulkyne is to reverse these trends and restore the parks to a condition as close as possible to that existing prior to European settlement (National Parks Service 1984). In addition to the ecological changes noted above, it has been suggested that the density of the kangaroo population at Hattah-Kulkyne increased after European settlement, and that there has been a consequent rise in the grazing pressure exerted by kangaroos to the extent that they now hinder attempts to rehabilitate the parks (National Parks Service 1984; Cheal 1986; Walters 1986). Accordingly, efforts have been made to reduce the population density of kangaroos in a badly degraded section of the park, as recounted by Cheal (1986). The aim of this paper is to evaluate the historical and scientific evidence for the proposition that the density of kangaroos has increased since settlement.

The early explorers

The first Europeans to see the Hattah-Kulkyne area were members of the expedition led by Captain Charles Sturt. In 1830, Sturt's expedition journeyed down the Murray River by boat, from the junction of the Murray with the Murrumbidgee (Fig. 1) to its termination in Lake Alexandrina, then rowed back upstream on the return journey. Sturt (1833) apparently saw few kangaroos from the river. His only direct reference to kangaroos along the Murray was to several he startled when he walked some distance from the river near present-day Waikerie, South Australia.

In 1836, an expedition led by Major Thomas Mitchell travelled by land along the New South Wales side of the Murray from the Murrumbidgee to the Darling (Fig. 1), then returned by the same route. Mitchell (1839) recorded many more observations of flora and fauna than did Sturt, and frequently mentioned kangaroos. He noted that they were particularly numerous along the lower reaches of the Darling, but made no specific reference to kangaroos in the Hattah-Kulkyne area where he became pre-occupied with increasing attention from Aborigines, culminating in the 'dispersion' of the natives by gunfire opposite Britt Bend (Fig. 1).

The first of the 'overlanders', Joseph Hawdon and Charles Bonney, followed Mitchell two years later in 1838. Hawdon and Bonney drove cattle along much of the course of the Murray from Albury to Adelaide. Between the Murrumbidgee and the Darling their party remained on the Victorian side of the river. About 120 km

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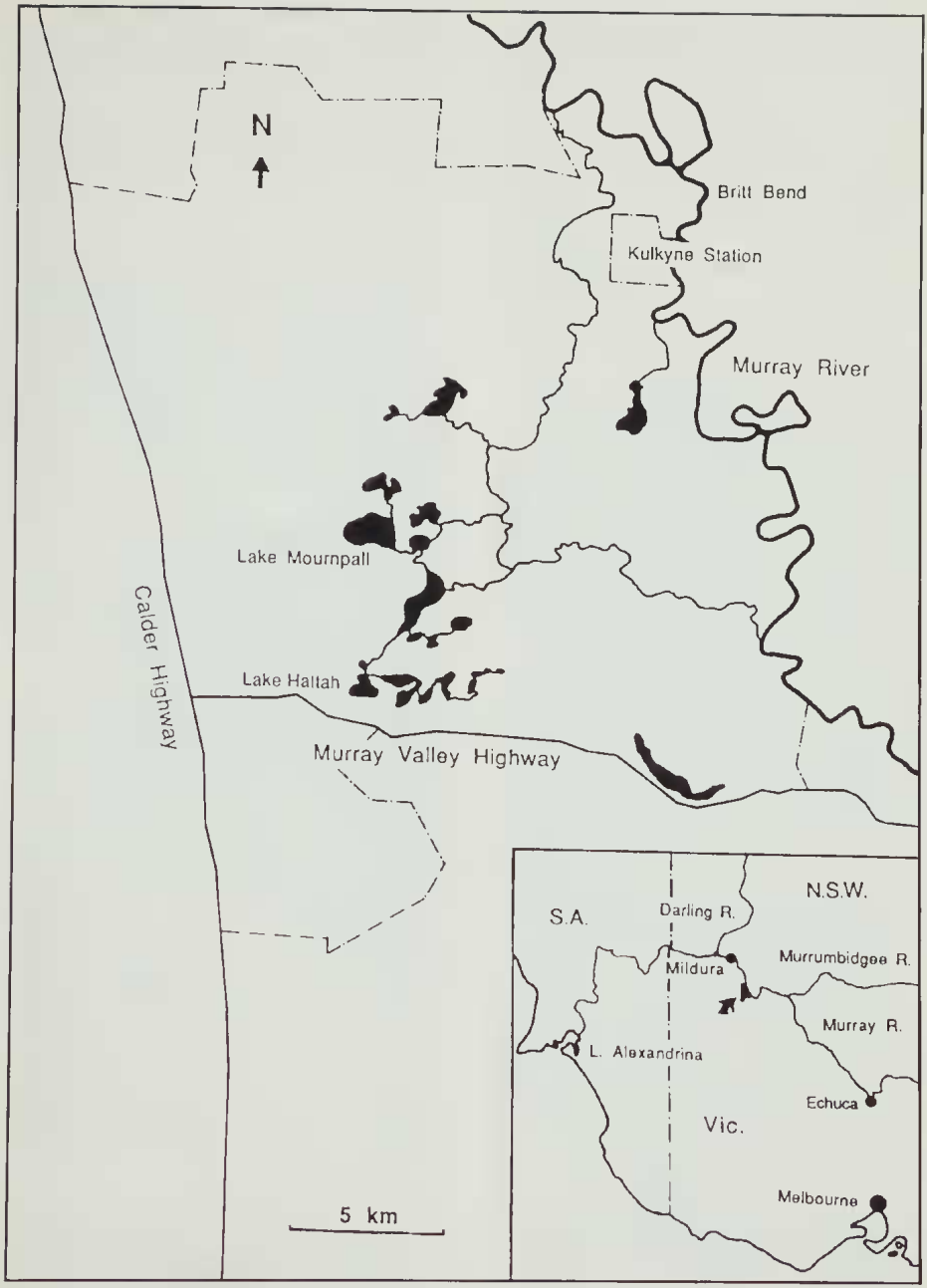

Fig. 1 Hattah-Kulkyne National Park and Murray Kulkyne Park, showing the lakes (shaded). The parks are largely bounded by the Calder Highway to the west, the Murray Valley Highway to the south, and the Murray River to the east. Other boundaries (__ . __ .) are shown. The inset shows the location of the parks (arrowed) in north-western Victoria.

downstream of the Murrumbidgee, Hawdon and a companion traced the channel of a water-course '...terminating in the dry beds of some extensive lakes...' (Hawdon 1952) and thus became the first Europeans to explore Hattah-Kulkyne. Although kangaroos were often mentioned elsewhere in Hawdon's (1952) journal, he made no reference to them at Hattah-Kulkyne, concentrating instead on a search for one of the members of the party and on the difficulty of driving the cattle through dense scrub.

The Blandowski expedition

More detailed records of the fauna were obtained during the scientific expedition led by William Blandowski in 1856-57. The expedition left Melbourne in December 1856 and travelled north-west via Echuca to 'Mondellimin' near the junction of the Murray and Darling Rivers (Fig. 1), where a permanent camp was established. Wakefield (1966) concluded that this encampment was at about the present location of Mildura, approximately 45 km north of Hattah-Kulkyne. Many specimens were collected from this general area, mainly by local Aborigines, from April to November, 1857. Blandowski made two lengthy forays alone to the west and north-east, then left 'Mondellimin' in August and returned to Melbourne. His account of the expedition (Blandowski 1858) gave little detail of the fauna recorded.

A second member of the expedition, Gerard Krefft, remained at 'Mondellimin' for a further three months after Blandowski's departure. Krefft kept detailed records of the species recorded by the expedition. His diary covered only the first part of the expedition, as far as Lake Boga (see Iredale and Whitley 1932), but his scientific paper (Krefft 1866) and his specimen catalogue and annotated list (see Wakefield 1966) provided the first comprehensive information on the distribution and status of the fauna of north-western Victoria.

Krefft (1866) recorded the Red Kangaroo, *Macropus rufus* (Desmarest), and grey kangaroos in the Mildura area. The specific identity of the grey kangaroos cannot be established with certainty because the specimens have been lost, but Krefft's use of the name 'Scrub Kangaroo' led Wakefield (1966) to conclude that most, if not all, were the Black-faced or Mallee Kangaroo (=Western Grey Kangaroo), *M. fuliginosus melanops* (Desmarest), as distinct from the Eastern Grey Kangaroo, *M. giganteus* Shaw. This conclusion is supported by the present distribution of the two species: the Western Grey Kangaroo is widespread in north-western Victoria and south-western New South Wales, while the Eastern Grey Kangaroo has been recorded there from only a few isolated localities (Caughley *et al.* 1984).

Krefft (1866) believed that, by the time of the expedition, the Macropodoidea (kangaroos and wallabies) had already declined in numbers along the Murray as a result of competition with cattle and sheep. Stock had been introduced to Hattah-Kulkyne ten years earlier when the 'Kulkyne' and 'Mournpool' runs were taken up in 1847 (Billis and Kenyon 1932). Although the Red Kangaroo had '... become very scarce...' in Victoria, the Western Grey Kangaroo was '...much more common...' (Krefft 1866) than the Red Kangaroo and was '...very common on both sides of the Murray...' (see Wakefield 1966). Of the smaller species of the Macropodoidea, the Bridled Nailtail Wallaby, *Onychogalea fraenata* Gould, was common (Krefft 1866; Wakefield 1966). Despite poisoning of the Dingo, *Canis familiaris dingo*, by settlers, Krefft (1866) considered it, the major non-human predator of kangaroos, to be plentiful along the Murray.

These observations of kangaroo numbers are at variance with others attributed to Krefft by the National Parks Service (1984) and Cheal (1986), which suggested that kangaroos were scarce in north-western Victoria in 1856-57. The discrepancy has arisen because the records of the Blandowski expedition were misinter-

preted; the comments cited by the National Parks Service (1984) and Cheal (1986) were taken from Krefft's diary, which was not kept beyond Lake Boga (130 km south-west of Hattah-Kulkyne) and which probably referred only to Eastern Grey Kangaroos.

The 1900's

The first scientist to record impressions specifically of Hattah-Kulkyne was J. G. O'Donoghue (1915), who visited the area in September 1914. At this time the area had experienced 12 months of the 1913-15 drought. O'Donoghue camped near Kulkyne Station for 10 days, venturing as far south as Lake Mournpall and Lake Hattah (Fig. 1). He visited the Raak area, to the west of Hattah-Kulkyne, in October of the following year after the drought had broken (O'Donoghue 1916). His narratives included a number of references to 'Black-faced' kangaroos, but made no comment on their abundance. No mention was made of Red Kangaroos or smaller macropodoids in Hattah-Kulkyne or Raak.

O'Donoghue made a number of observations on the European impact on Hattah-Kulkyne. His only reference to land-clearing was to stands of Black Box which had been felled or ring-barked, although wind erosion on dunes was mentioned. Failure of regeneration was evident at this early date: 'During all our extensive wanderings in Raak, as in the neighbourhood of Lake Mournpoul, not a single young plant, if we omit the Weeping Pittosporum, of any of the trees or shrubs met with was noticed' (O'Donoghue 1916). He also noted the effect of the drought on sheep and rabbits, and described the efforts to control rabbits by fencing and poisoning. Few of the predators of macropods remained: O'Donoghue apparently did not see a Dingo, although they were mentioned several times in passing, and the demise of the local Aboriginal population was recounted in detail.

The Kulkyne State Forest was declared in 1924 to ensure supplies of firewood, sleepers and *Callitris* posts. Hattah-Kulkyne then began to receive increasing attention from naturalists. Most of their descriptions of the area did not include kangaroos (Chandler 1938; Morrison 1941; Bryant 1943), although Jones (1942) noted that 'Mallee kangaroos' occurred in the riverine woodland and on the open dunes. Later, Jones (1952) reported a sighting of a group of Red Kangaroos in the Raak area.

Hattah Lakes National Park was declared in 1960. At that time, regeneration of *Callitris* and *Casuarina* evidently had not occurred due to grazing by rabbits, which were very common, and by domestic stock. The Western Grey Kangaroo was referred to as '...numerous...' and the Red Kangaroo was said to be present '...in small numbers...' (Victorian National Parks Association 1959). Descriptions of the new park (Garnett 1960; Jacobs 1963) mentioned kangaroos, but seemingly did not consider their numbers to be noteworthy. Eight years after its establishment, Anderson (1968) stated that Western Grey Kangaroos were '...quite common...' and that there was '...a small population of rarely more than 2 dozen...' Red Kangaroos in the park.

Population surveys

The first quantitative data on the population density of kangaroos in Hattah-Kulkyne were obtained by Cochrane and McDonald (1966). They surveyed an area of open dune and riverine woodland near Lake Hattah using counts of tracks and faecal pellets as simple indices of population density. Unfortunately, the area they surveyed was small, and their methods were insufficiently detailed to permit any meaningful comparison with the present population.

In 1980 Kulkyne State Forest and Hattah Lakes National Park were incorporated into the present Hattah-Kulkyne National Park and Murray-Kulkyne Park (National Parks Service 1984). In the same year the first census of kangaroos in the whole of the enlarged park was conducted

by aerial survey (Short and Grigg 1982) and three more surveys were made between 1982 and 1984, which indicated that the population density was at its highest at the beginning of the 1982-83 drought (see Walters 1986). Aerial surveys have since been superseded by ground surveys, which offer greater accuracy. The ground surveys began in 1983 and have continued annually (Morgan 1987). They confirm that the Western Grey Kangaroo is much more abundant than the Red Kangaroo, comprising about 95% of the total kangaroo population at Hattah-Kulkyne. The density of Western Grey Kangaroos has shown a gradual increase from 25 km^2 in 1983 to 36 km^2 in 1987, as the population recovered from the 1982-83 drought (Morgan 1987). These density estimates are mean values derived from transects through the full range of kangaroo habitats in the parks. They obscure the fact that some habitats, particularly open *Callitris-Casuarina* woodland, generally carry higher densities than others, such as mallee scrub. This variation limits the comparisons that can be drawn with equivalent estimates of overall density for the two similar parks in the region where long-term monitoring of kangaroo populations has been conducted. However, some indication of the relative density of the Hattah-Kulkyne population can be gained: the density of Western Grey Kangaroos at Wyperfeld National Park, north-western Victoria, ranged from 10 to 46 km^2 over a period of 14 years (Morgan 1986); at Kinchega National Park, south-western New South Wales, it ranged from 5 to 18 km^2 over 12 years (Bayliss 1987), and the park also carried Red Kangaroos at about three times this density.

Conclusion

There is no conclusive evidence for any change in the kangaroo population at Hattah-Kulkyne since European settlement. Western Grey Kangaroos were described as 'common' in the area in 1856 (see Wakefield 1966) and again almost 130 years later (Davis and Drake 1983). Equally, it cannot be concluded with certainty that the population density of kangaroos at Hattah-Kulkyne has remained essentially unchanged in the intervening time. Jarman and Johnson's (1977) analysis of bounty payments suggested that kangaroo populations in New South Wales initially rose after settlement then declined in the late 1800's, probably due to competition with rabbits and sheep. A similar process may have occurred during that period at Hattah-Kulkyne, but the published historical data are equivocal. Only scanty and subjective impressions of density are available for much of the period of interest. Quantitative data are quite recent, and show that the population density is within the range of fluctuations recorded in comparable parks.

This conclusion has implications for the management of Hattah-Kulkyne since neither the historical evidence or the recent scientific surveys provide a justification for reduction of the kangaroo population. However, comparisons of the present density of the Hattah-Kulkyne population with other populations in space and time have little bearing on the management problem. The issue is the degree to which the present population is hindering efforts to restore the parks. Decisions on population control must be based on data that are directly relevant to the management objective, which in this case can be obtained from studies of dietary preferences of the kangaroos (e.g. Norbury 1987) and studies of the responses of vegetation to grazing pressure (e.g. Mueck *et al.* 1984).

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REFERENCES

Anderson, G. (1968). Hattah Lakes National Park. *Victoria's Resources.* 10(3): 20-21.

Bayliss, P. (1987). Kangaroo dynamics. *In* Caughley, G., Shepherd, N., and Short, J. (Eds.) *Kangaroos: their Ecology and Management in the Sheep Rangelands of Australia.* Cambridge University Press, Cambridge.

Billis, R.V., and Kenyon, A.S. (1932). *Pastoral Pioneers of Port Phillip.* Macmillan, Melbourne.

Blandowski, W. (1858). Recent discoveries in natural history on the lower Murray. *Trans Phil. Inst. Vict.* 2: 124-137.

Bryant, C.E. (1943). Mallee Days. *Wild Life.* 5(1): 5-8.

Caughley, G., Brown, B., Dostine, P., and Grice, D. (1984). The grey kangaroo overlap zone. *Aust. Wildl. Res.* 11:1-10.

Chandler, L.G. (1938). In the land of pine and belar. *Victoriun Nat.* 55: 115-119.

Cheal, D. (1986). A park with a kangaroo problem. *Oryx* 20:95-99.

Cochrane, G.R., and McDonald, N.H.E. (1966). A regeneration study in the Victorian Mallee. *Victorian Nat.* 83:220-226.

Davis, B.W., and Drake, G.A. (1983). *Australia's Biosphere Reserves: Conserving Ecological Diversity.* Australian National Commission for UNESCO, Canberra.

Garnet, J.R. (1960). The Kulkyne. *Victorian Nat.* 76:314-316.

Hawdon, J. (1952). *The Journal of a Journey from New South Wales to Adelaide.* Georgian House, Melbourne

Iredale, T., and Whitley, G.P. (1932). Blandowski. *Victorian Nat.* 49:90-96.

Jacobs, V. (1963). Random notes from the Kulkyne. *Victorian Nat.* 80:4-8.

Jarman, P.J., and Johnson, K.A. (1977). Exotic mammals, indigenous mammals, and land-use. *Proc. Ecol. Soc. Aust.* 10:146-166.

Jones, J. (1942). The Kulkyne National Forest. *Emu.* 42: 1-12.

Jones, J. (1952). The Hattah Lakes Camp-out, October 1951. *Emu.* 52: 225-254.

Krefft, G. (1866). On the vertebrated animals of the lower Murray and Darling, their habits, economy and geographical distribution. *Trans. Phil. Soc. N.S.W.* 1862-65:1-33.

Mitchell, T.L. (1839). *Three Expeditions into the Interior of Eastern Australia; with Descriptions of the Recently Explored Region of Australia Felix und the Present colony of New South Wales.* T. & W. Boone, London.

Morgan, D.G. (1986). *Estimating vertebrate population densities by line transect methods.* Centre for Program Evaluation, Melbourne College of Advanced Education: Melbourne.

Morgan, D.G. (1987). *Hattah-Kulkyne National Park and Murray-Kulkyne State Park kangaroo populations, July 1987.* Centre for Program Evaluation, Melbourne College of Advanced Education: Melbourne.

Morrison, P.C. (1941). Our newest National Forest – 120,000 acres of glory. *Wild Life.* 3(11): 431-433.

Mueck, S.G., McGuckin, J. and Gel, P.A. (1984). *Vegetation Monitoring Survey, October 1984. Hattah-Kulkyne National Park.* Environmental Management Services, Melbourne.

National Parks Service (1984). *Hattah-Kulkyne National Park and Murray-Kulkyne Park Management Plan.* Department of Conservation, Forests and Lands, Melbourne.

Norbury, G.L. (1987). Diet selection and demography of the Western Grey Kangaroo, *Macropus fuliginosus melanops* Desmarest, in Hattah-Kulkyne National Park. Ph.D. Thesis, Monash University.

O'Donoghue, J.G. (1915). Wanderings on the Murray flood-plain. *Victorian Nat.* 32:7-20, 26-35.

O'Donoghue, J.G. (1916). Rambles in Raak. *Victorian Nat.* 33:7-15,19-28.

Short, J., and Grigg, G.C. (1982). The abundance of kangaroos in suboptimal habitats: wheat, intensive pastoral, and mallee. *Aust. Wildl. Res.* 9:221-227.

Sturt, C. (1833). *Two Expeditions into the Interior of Southern Australia, during the Years 1828, 1829, 1830, and 1831: with Observations on the Soil, Climate and General Resources of the Colony of New South Wales.* Smith, Elder & Co., London.

Victorian National Parks Association (1959). Request to the Government of Victoria asking that all of the Kulkyne State Forest be made a National Park. *Victorian National Parks Association Newsletter* No. 27,1-25.

Wakefield, N.A. (1966). Mammals of the Blandowski expedition to north-western Victoria. *Proc. Roy. Soc.* Vict. 79:371-391.

Walters, B. (1986). Restoring Hattah-Kulkyne National Park. *Trees and Natural Resources* 28 (1):2-7.